UNUSUAL PREY CAPTURE AND TRANSPORT BY *DOLICHOVESPULA MACULATA* (HYMENOPTERA: VESPIDAE)[1]

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ABSTRACT: Capture of *Tabanus sulcifrons* by a worker *Dolichovespula maculata* is described. The prey was atypically large, being about the same size as the wasp. Partial mutilation of the prey and an atypical method of prey transport, possibly related to large prey size, are detailed.

Dolichovespula maculata (L.), the baldfaced hornet, is one of the most common vespids in the eastern United States (Akre *et al.* 1980, Greene 1991). Little is known about the biology, ecology, and physiology of this species, and observations of unusual behavior are noteworthy. This species is an opportunistic forager and captures a variety of insects, including workers of other yellowjacket species, but adult flies seem to be the preferred prey (Duncan 1939, MacDonald and Deyrup 1989). MacDonald and Deyrup (1989) noted that workers are "particularly adept at capturing adult flies," and observed them taking adult Calliphoridae, Muscidae and Sarcophagidae, with one wasp collecting up to 17 flies per hour.

On 30 July 1991 in a backyard in Auburn, Cayuga County, New York, I observed a worker baldfaced hornet capturing, mutilating and transporting toward her nest an adult horse fly of about her own size. The *D. maculata* flew in and pounced upon a female *Tabanus sulcifrons* Macquart which was resting on a twig of a northern white cedar *(Thuja occidentalis)*, ca. 1 m above ground. The wasp grasped the fly by its neck, using the mandibles, and maintained this hold for ca. 25 sec. She then released this grasp and, still straddling the horse fly head forward and dorsal side up, moved anteriorly on it and began to mutilate the fly's head with the mandibles. She masticated the fly's head for nearly 2 min. until it was unrecognizable as such and then began to do likewise to the fly's prothorax. The horse fly's right foreleg was removed in the process. Then, still holding the fly head forward and dorsal side up, the wasp grasped it with all legs and flew at an angle to the ground. During flight she resembled a *Sphecius speciosus* (Drury) (Sphecidae) transporting a *Tibicen* sp. (Cicadidae) to her nest! The baldfaced hornet proceeded to

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transport the horse fly, head forward and dorsal side up, on the ground in a series of flights, 5-10 cm long and 1-2 cm high. The wasp's wings beat continually, and they produced a barely audible buzzing sound during flight. About every 40-50 cm she paused and, remaining atop the fly, mutilated the anterior part of its thorax. After several such pauses and mutilations and a journey of nearly 5 m, she reached the base of one of many cedars growing in a row and began walking up its trunk at which time I collected the pair. Her nest was located two-thirds of the way up the 15 m-high cedar. The wasp weighed (wet) 234 mg and the partly mutilated fly, 179 mg (ratio of wet wgt. of wasp to prey, 1.3:1). The following day two other *D. maculata* workers were seen landing on this cedar, one with a nearly complete thorax of and the other with a thoroughly mutilated thorax and partial abdomen of *T. sulcifrons*.

DISCUSSION

Duncan (1939) noted that vespines often discard the prey's legs and wings "because of their high percentage of heavily sclerotized integument and their relatively non-nutritious character." Schaefer (1991) found that worker baldfaced hornets would often amputate the wings, heads, legs, and parts of the abdomens of male gypsy moths and a damselfly prior to taking these prey to the nest. The thoracic musculature was, in all cases, saved and fed to the larval wasps. In the case of one female gypsy moth the hornet made no attempt to fly with this heavy prey but, instead, severed and discarded the head and much of the prothorax and abdomen before taking flight (Schaefer 1991). The question remains, therefore, whether or not the worker baldfaced hornet I observed would have continued to mutilate the head, thorax and abdomen of her horse fly as she ascended the cedar or take this unusually large prey item intact to the nest.

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BOOK REVIEW

BIOLOGY OF BLOOD-SUCKING INSECTS. M.J. Lehane. 1991. Harper, Collins Academic, London. 228 pp. $50.00 cloth, $29.95 paper.

Topics studied include location of the host, host-insect interactions, ingesting and managing the blood meal, and transmission of parasites by blood-sucking insects. These topics are prefaced by a brief introduction to the importance of these insects and by a review of the current theories of how their specialized lifestyle evolved. The last chapter in this book provides an overview of the insect groups studied, a section that I believe would have been much better situated as the first chapter. While the book is intended for advanced students or for researchers seeking to broaden their base, I think that even these people would benefit by having an introductory chapter that reviews the pertinent groups, not to mention the benefit to those of us who are not entomologists and who spent a great deal of time flipping to the last chapter and frantically skimming the pages until locating the desired group!

Any book that is intended to be primarily a review of the major aspects and findings in a field as diverse as this will by nature be somewhat incomplete, and Mr. Lehane's book is no exception. The documentation is somewhat sketchy at times, leaving one to wonder whether the information presented is a summary of the cited authors or an opinion or conclusion drawn by Mr. Lehane. However, it appears that this is mainly due to the paucity of information available. What I found to be the most remarkable aspect of this book was how little is known about many of the important species of blood sucking insects. While it is true that much research has been done on mosquitoes and tsetse flies, both important disease vectors, there are a great many important things still unknown about these insects. And of the information that has been discovered, the findings very often cannot be generalized to include other genera, and frequently they do not apply to other species within a given genus.

As Mr. Lehane pointed out in his introduction, this book is not intended as a primary textbook for students of medical or veterinary entomology. The focus is on topics of biological importance to the specific task of hemophagia. So while the reproductive patterns of certain blood-sucking insects are discussed at some length, this is done so only in light of how a blood meal will affect such behavior. Very little is discussed of reproductive anatomy or behavior unless it contributes to the blood-sucking way of life. This approach is employed for all topics addressed, so for details on such matters one must turn to one of the numerous books dealing with such issues. As such the book is very interesting and useful for those seeking a synthesis of current information on a broad number of species, but it cannot and should not replace a textbook on a given disease or insect group.

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